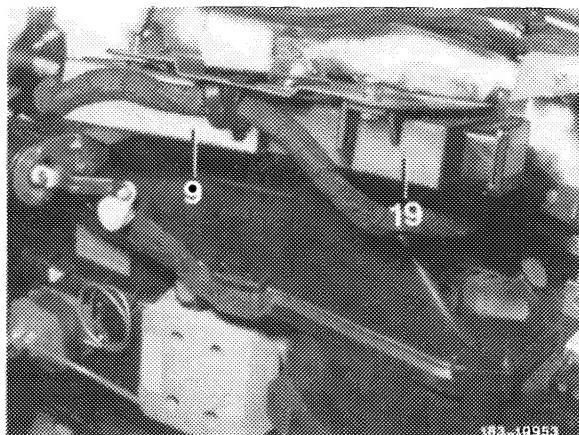


83-603 Function test of total system and remedies (with adapter)

Note

1. During electric test on 2-point coupling of mono-valve (with voltmeter, test lamp), be sure to avoid a short, since this may destroy the electronic switching unit for temperature control.
2. Perform test program in the event of unknown causes of trouble, customer complaints which are not clearly expressed, and following repairs for guaranteeing all functions.
3. Prior to starting the following test, check all fuses for automatic climate control, auxiliary fan and blower motor. It is additionally recommended to perform a manual and optional function test of air flaps according to 83-601.

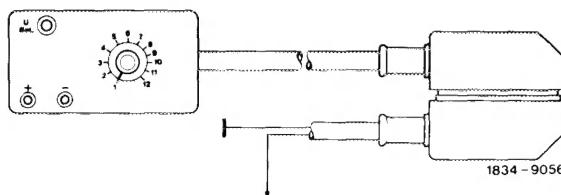
9 Electronic control unit
for temperature control
19 Electronic switching unit
for blower control



Test

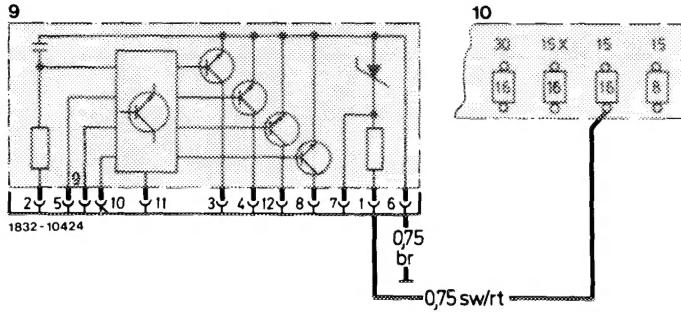
Testing voltage supply and connecting lines 1 and 6	
Switch-on ignition:	
Position of adapter switch	Nominal value
1	>11 V
Nominal value correct	Nominal value wrong

1. Test electric lines and fuses for correct connection and interruption.
2. Test battery for state of charge.



Wiring diagram for test step 1 with adapter

9 Electronic switching unit for temperature control
10 Fusebox



Testing in-car temperature sensor (7)

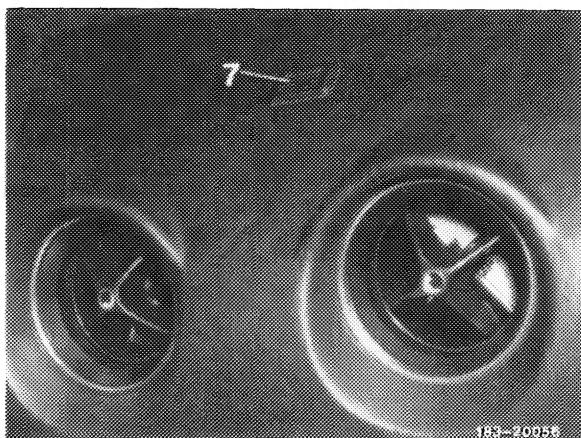
Remove 2-point coupling from in-car temperature sensor (7) and connect additional line from adapter to in-car temperature sensor and to multimeter (volt-ohmmeter).

Disconnect battery, switch-on ignition.

Ambient temperature	Nominal value
$\pm 0.5 \text{ k}\Omega$	

15 °C	15.7 kΩ
25 °C	10.0 kΩ
35 °C	6.5 kΩ
60 °C	2.5 kΩ

Nominal value correct	Nominal value wrong
-----------------------	---------------------



Replace in-car temperature sensor.

Testing connecting lines 6 and 10

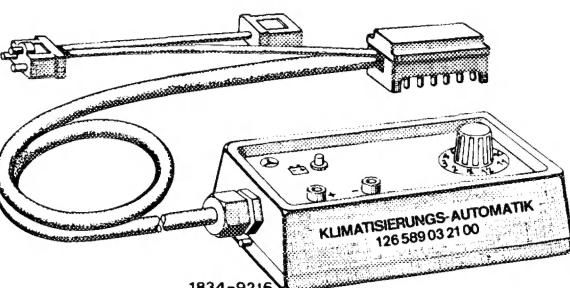
Connect 2-point coupling of auxiliary harness from in-car temperature sensor. Connect plug of additional line/adapter to 2-point coupling from harness and bridge 2-point coupling from auxiliary harness.

Disconnect battery, switch-on ignition

Position of adapter switch	Nominal value
----------------------------	---------------

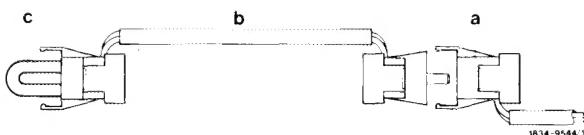
2	0 Ω
----------	-----

Nominal value correct	Nominal value wrong
-----------------------	---------------------



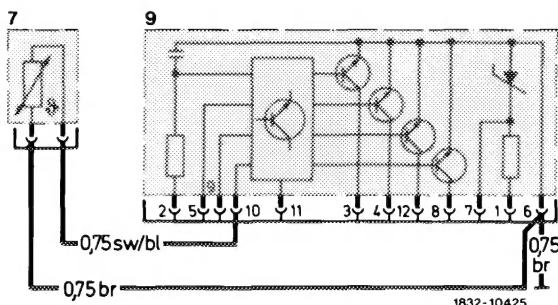
1. Check electric lines for correct connection.
2. Replace control unit.

a Coupling from harness in-car sensor.
b Additional line from adapter
c Bridge



Wiring diagram for test step 2 with adapter

7 In-car temperature sensor
9 Electronic switching unit for temperature control

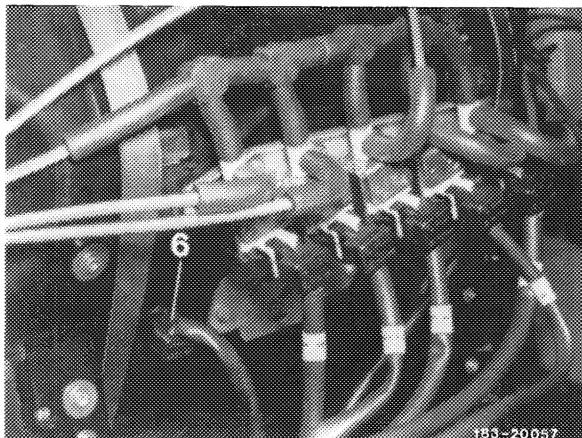


Testing temperature sensor (6) for heat exchanger and connecting lines 6 and 9

Disconnect additional line/adapter and plug 2-point coupling for in-car temperature sensor on again.

Disconnect battery, switch-on ignition.

Position of adapter switch	Ambient tempera- ture heat exchanger	Nominal value $\pm 0.5 \text{ k}\Omega$
3	15 °C	15.7 kΩ
	25 °C	10.0 kΩ
	35 °C	6.5 kΩ
	80 °C operating temperature	1.5 kΩ



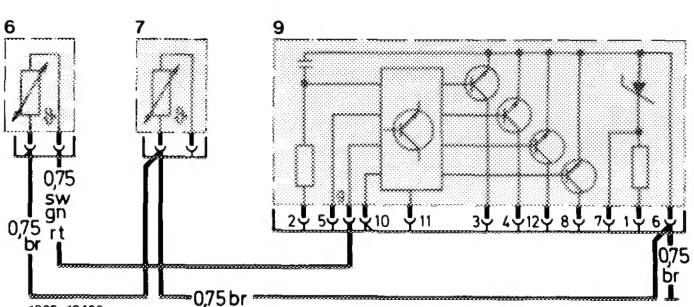
133-20057

Nominal value correct Nominal value wrong

1. Check electric lines for correct connection.
 2. Replace temperature sensor for heat exchanger.

Wiring diagram for test step 3 with adapter

- 6 Temperature sensor for heat exchanger
 - 7 In-car temperature sensor
 - 9 Electronic switching unit for temperature control



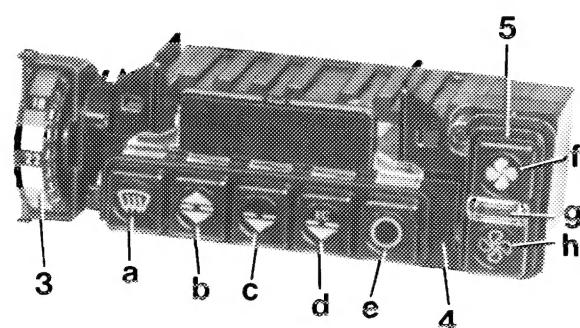
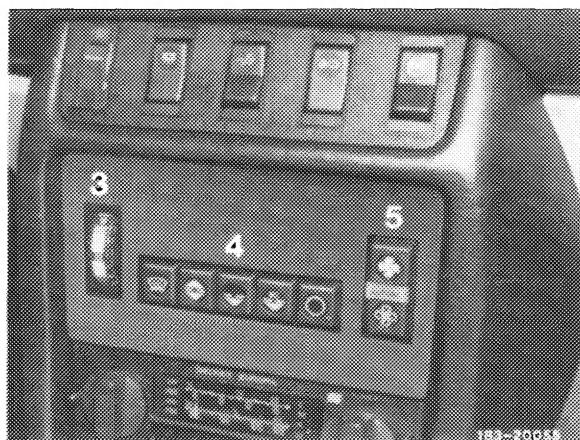
Testing temperature dial (3) and connecting lines 5 and 6

Disconnect battery, switch-on ignition.
Function selection button "c" pushed.

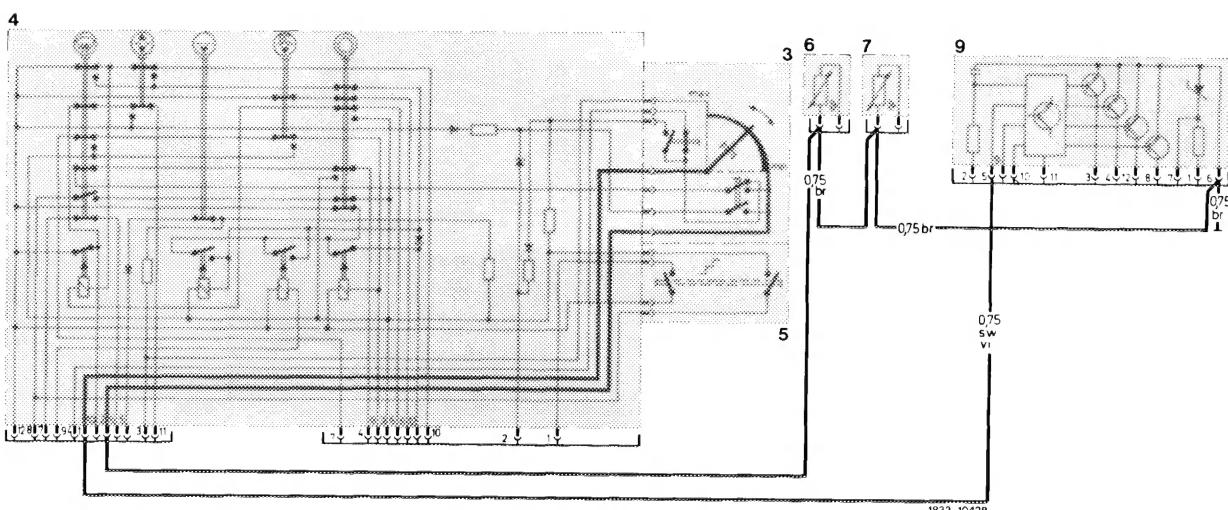
Position of adapter switch	Position of temperature dial	Nominal value
4	"MIN" (engaged) 22 °C "MAX" (engaged)	1.6 kΩ 3.15 kΩ 1.6 kΩ

Nominal value correct	Nominal value wrong
-----------------------	---------------------

1. Check electric lines for correct connection.
2. Connect new temperature dial, if test step 7 also shows deviating values.
3. Replace pushbutton switching unit.



183-17660/1



Wiring diagram for test step 4 with adapter

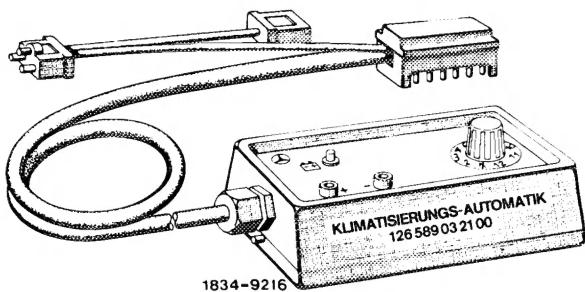
- | | | |
|---|-----------------------------|---|
| 3 Temperature dial | 4 Pushbutton switching unit | 6 Temperature sensor for heat exchanger |
| a Defrosting | b Overall ventilation | 7 In-car temperature sensor |
| c Normal adjustment (air conditioning on) | d EC (air conditioning off) | 9 Electronic switching unit for temperature control |
| e Off | | |

Testing electromagnetic coupling (26) and connecting lines 2 and 6 via switchover valve 8

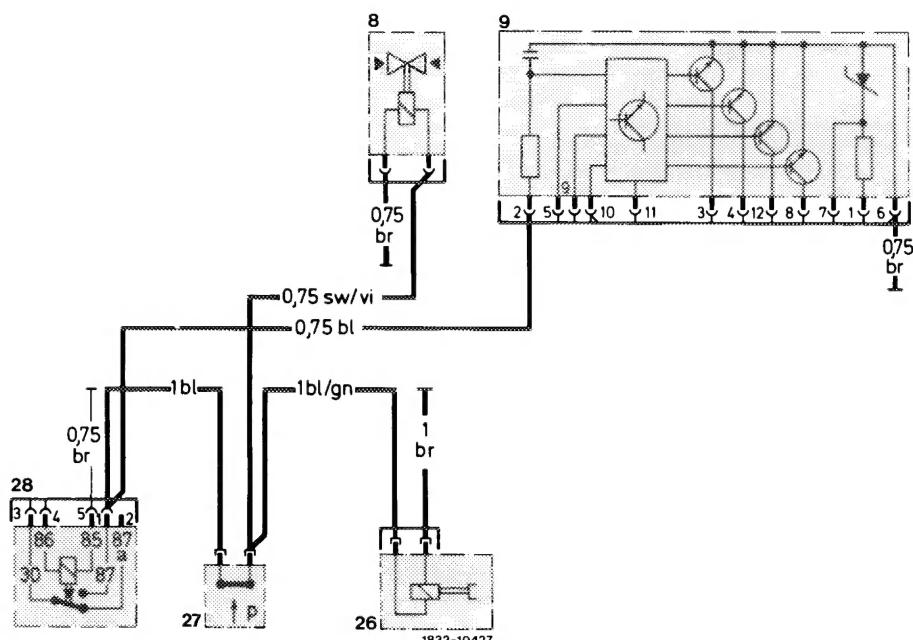
Disconnect battery, switch-on ignition.

Position of adapter switch	Nominal value $\pm 1 \Omega$
5	4 Ω

Nominal value correct	Nominal value wrong
-----------------------	---------------------



1. Check electric lines for correct connection.
2. Test switchover valve (8) for ground connection (only if readout is approx. 0Ω).
3. Pressure switch refrigerant compressor no passage or refrigerant charge too low (only with readout ∞).
4. Replace electromagnetic coupling.



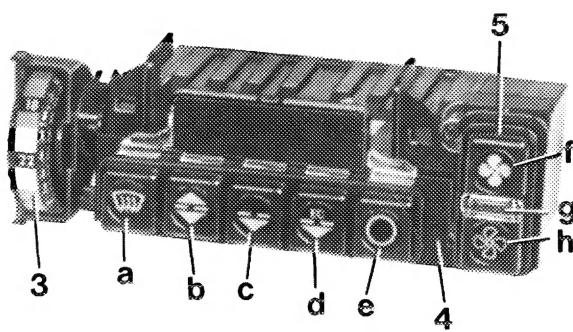
Wiring diagram for test step 5 with adapter

- 8 Switchover valve for rpm stabilization
- 9 Electronic switching unit for temperature control
- 26 Electromagnetic coupling-refrigerant compressor
- 27 Pressure switch refrigerant compressor
- 28 Relay refrigerant compressor

Testing function selection "c" or "e", as well as connecting lines 1 and 3

Disconnect battery, switch-on ignition.

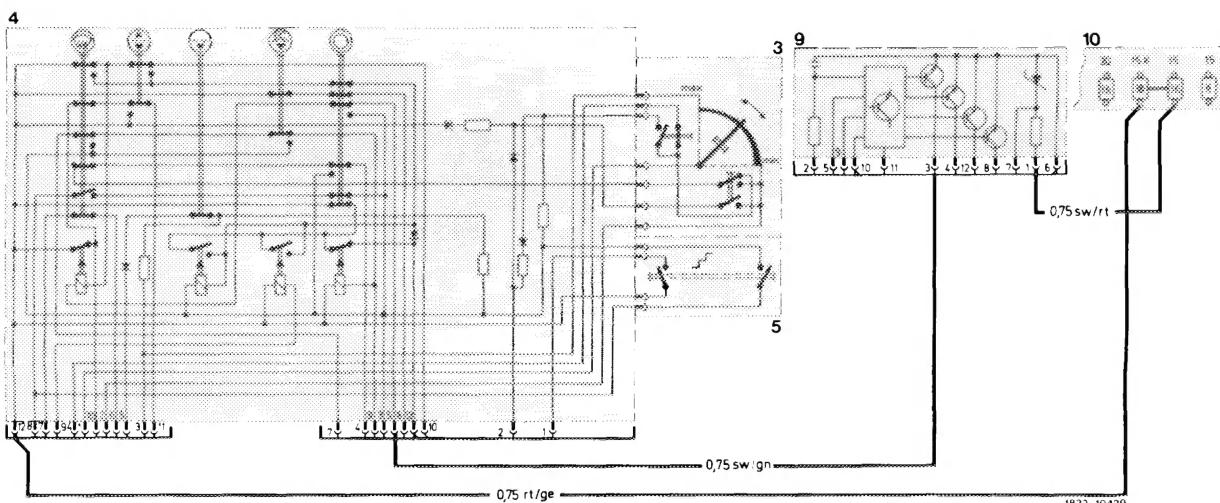
Position of adapter switch	Function selection	Nominal value
		$\pm 30 \Omega$
6	"c" pushed "e" pushed	80 Ω ∞



183-17660/1

1. Check electric lines for correct connection.

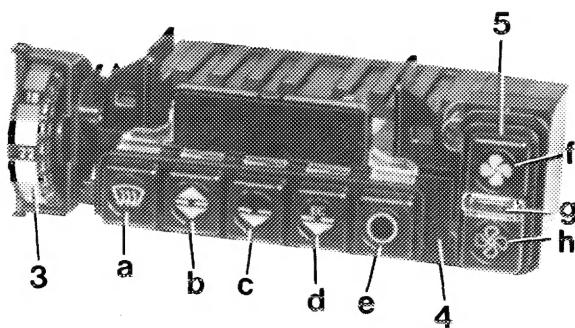
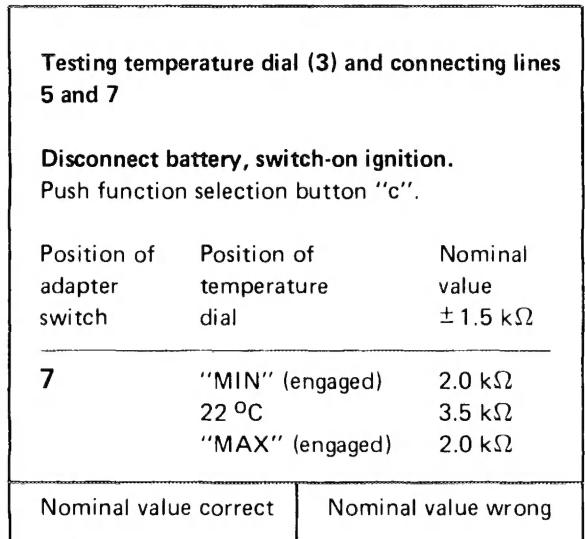
2. Renew pushbutton switch unit.



Wiring diagram for test step 6 with adapter

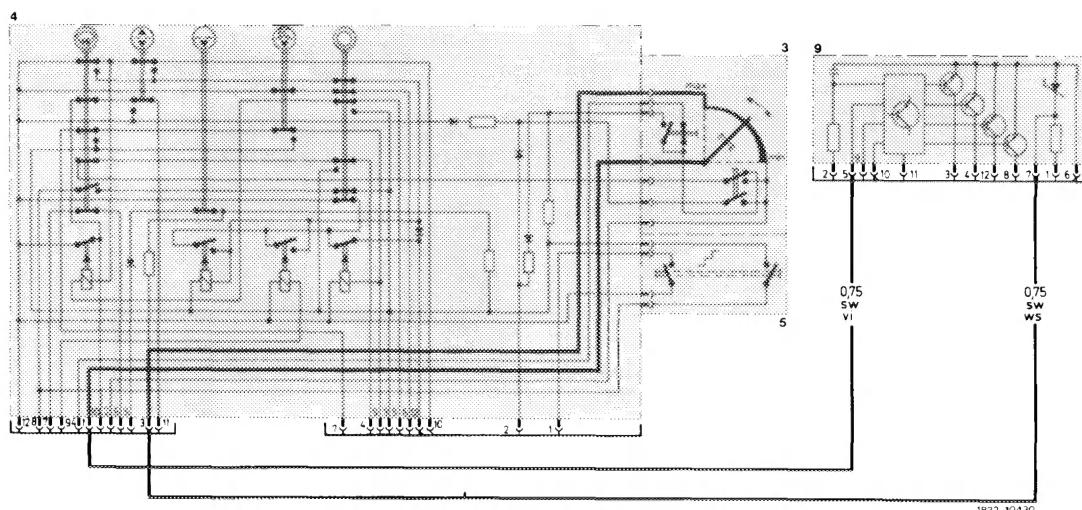
- 4 Pushbutton switch unit
 - a Defrosting
 - b Top and bottom
 - c Normal position (air conditioning on)
 - d EC (air conditioning off)
 - e Off

- 9 Electronic switching unit for temperature control
- 10 Fuse box



183-17660/1

1. Check electric lines for correct connection.
2. Renew temperature dial (potentiometer).
3. Renew pushbutton switch unit.



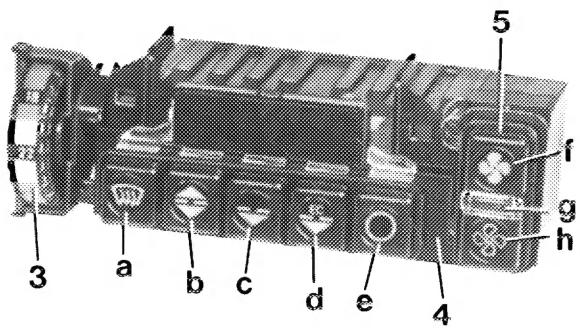
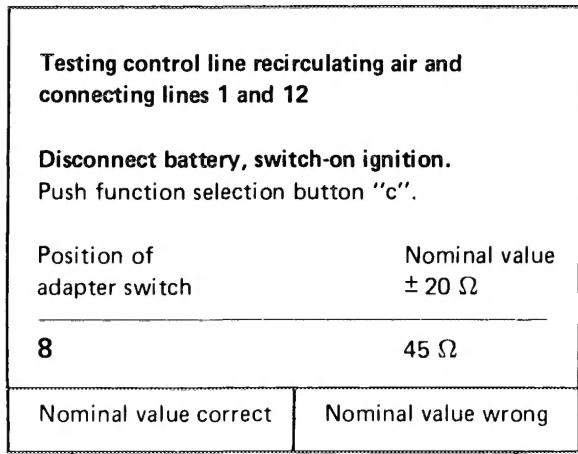
Wiring diagram for test step 7 with adapter

3 Temperature dial

4 Pushbutton switch unit

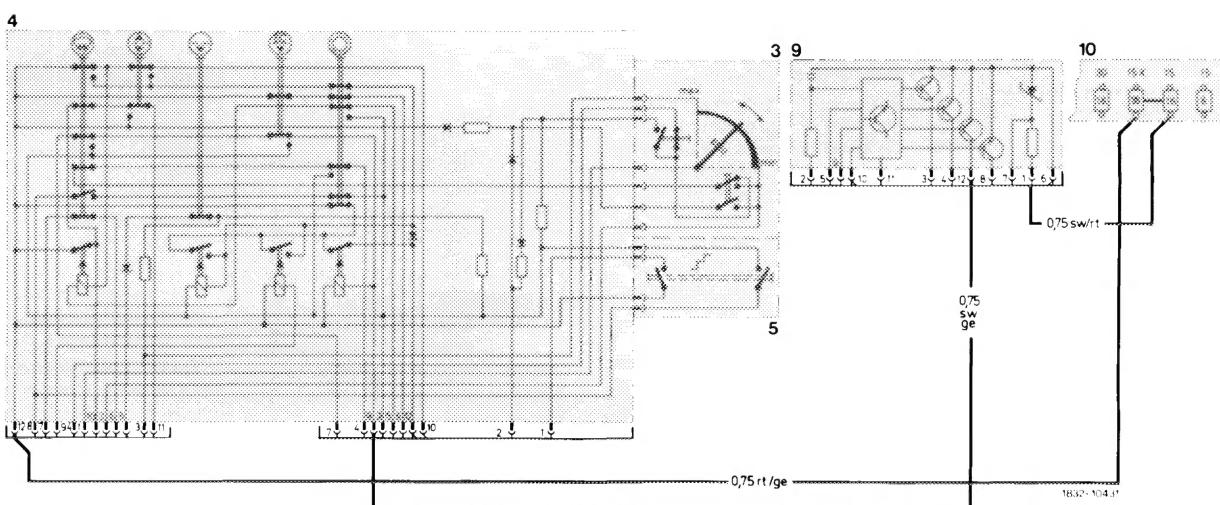
9 Electronic switching unit for temperature control

- a Defrosting
- b Top and bottom
- c Normal adjustment (air conditioning on)
- d EC (air conditioning off)
- e Off



183-17660/1

1. Check electric lines for correct connection.
2. Pushbutton switch unit defective.
3. Switchover valve defective.



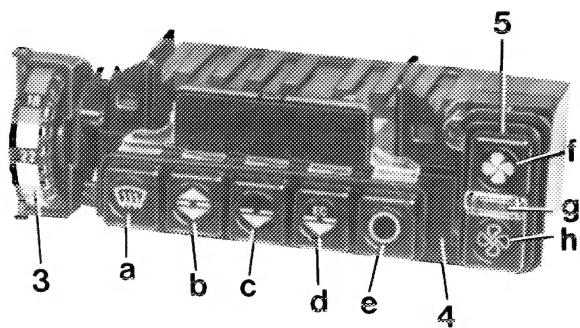
Testing switchover valve (13) for center nozzle flap and connecting lines 1 and 4

Disconnect battery, switch-on ignition.
Push function selection button "c".

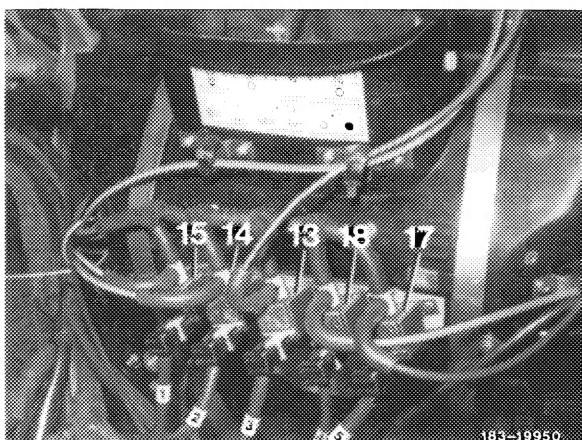
Position of adapter switch	Nominal value $\pm 20 \Omega$
9	45 Ω

Nominal value correct	Nominal value wrong
-----------------------	---------------------

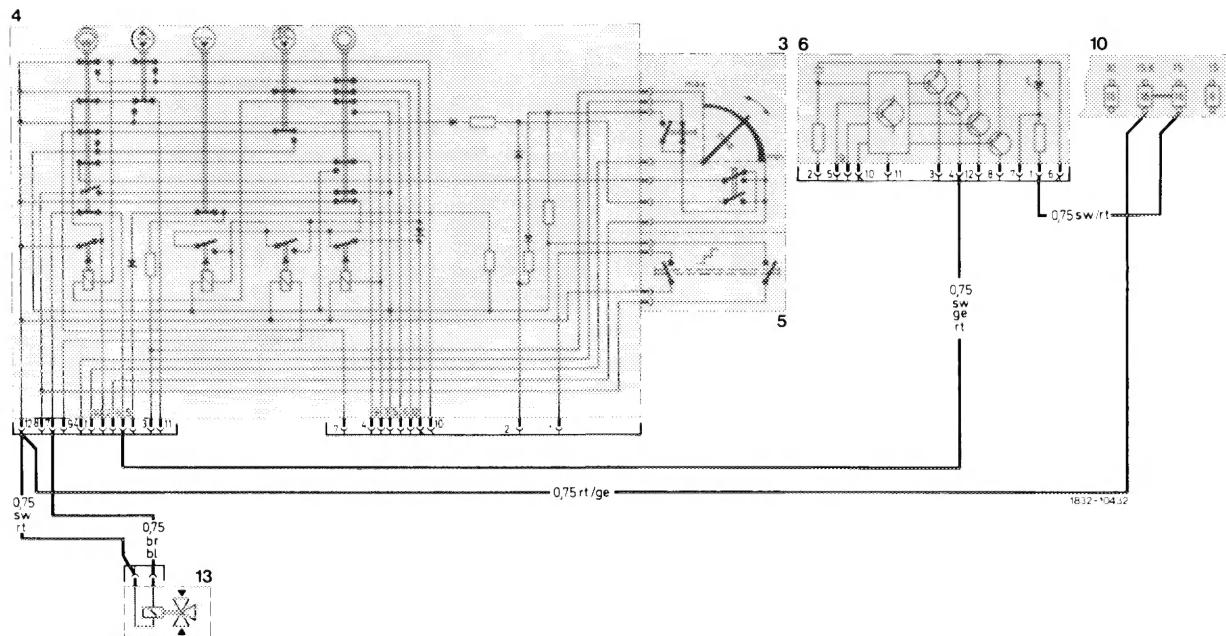
1. Check electric lines for correct connection.
2. Check switchover valve for center nozzle flap and renew, if required.
3. Renew pushbutton switch unit.



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183-39950



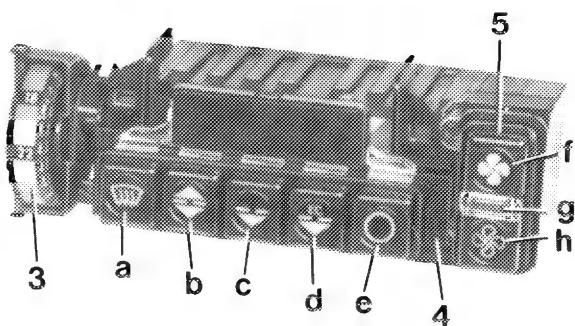
Testing function selection "c", connecting lines 6 and 11, as well as electronic switching unit for blower control (19)

Connect battery, switch-on ignition.

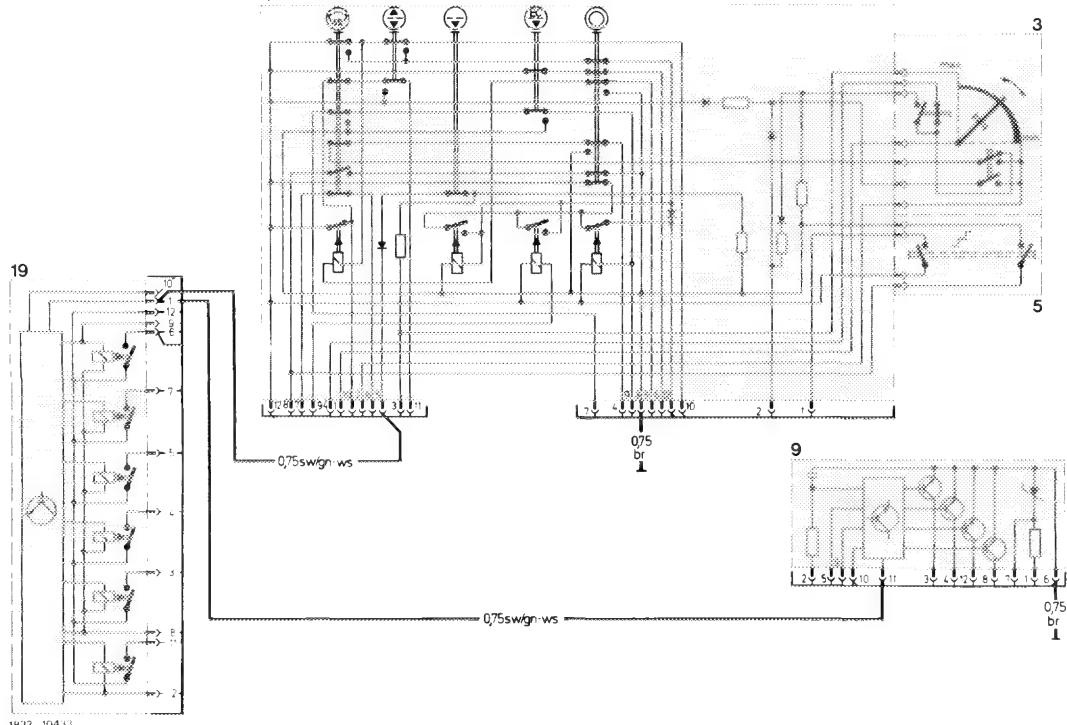
Position of adapter switch	Function selection	Nominal value
10	"c" pushed and "h" pushed	$\pm 0.3 \text{ V}$ 0.6 V

Nominal value correct	Nominal value wrong
-----------------------	---------------------

1. Check electric lines for correct connection.
2. Electronic switching unit for blower control defective.
3. Renew pushbutton switch unit.



183-17660/1



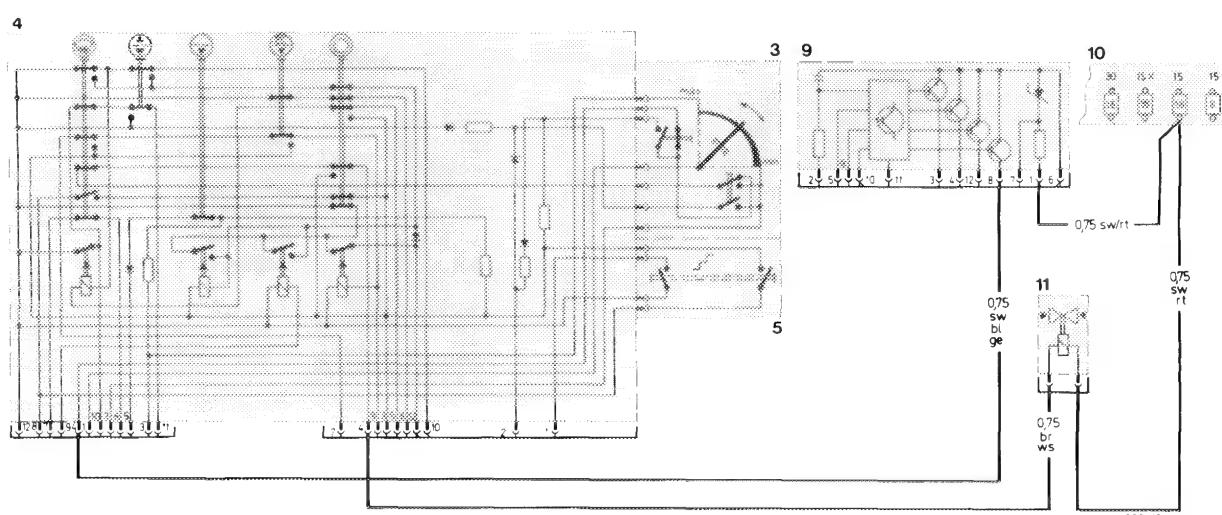
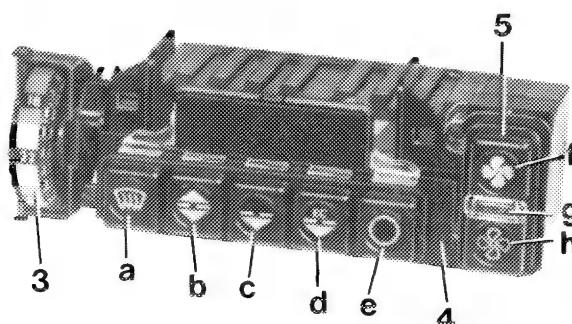
Wiring diagram for test step 10 with adapter

- | | |
|---|---|
| 3 Temperature dial | 9 Electronic switching unit for temperature control |
| 4 Pushbutton switch unit | 19 Electronic switching unit for blower control |
| a Defrosting | |
| b Top and bottom | |
| c Normal adjustment (air conditioning on) | |
| d EC (air conditioning off) | |
| e Off | |

Testing mono valve (11), function selection "c" and connecting lines 1 and 8		
Connect battery, switch-on ignition. Push function selection button "c".		
Position of adapter switch	Position of temperature dial	Nominal value $\pm 4 \Omega$
11	"MIN" (engaged) 22 °C "MAX" (engaged)	∞ 15 Ω ∞
Nominal value correct		Nominal value wrong



1. Check electric lines for correct connection.
2. Check mono valve, renew if required.
3. Renew pushbutton switch unit.



Wiring diagram for test step 11 with adapter

- | | | |
|-----------------------------|--------------------------|---|
| 3 Temperature dial | 4 Pushbutton switch unit | 5 Blower switch |
| a Defrosting | a Defrosting | 9 Electronic switching unit for temperature control |
| b Top and bottom | b Top and bottom | 10 Fuse box |
| c Normal position | c Normal position | 11 Mono valve |
| (air conditioning on) | (air conditioning off) | |
| d EC (air conditioning off) | | |
| e Off | | |

12 Testing blower motor (12)

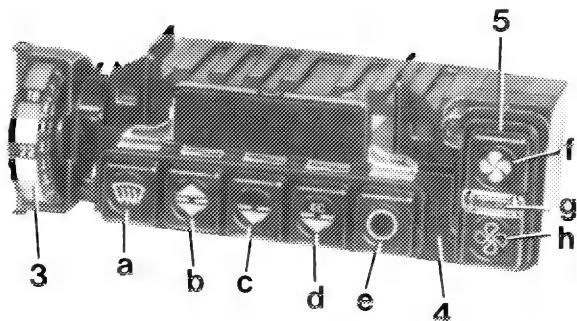
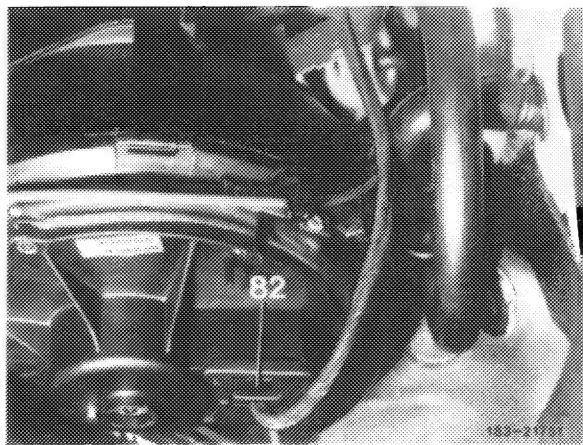
Plug-in coupling of electronic switching unit for temperature control.
Then pull 2-pole connecting coupling (82) from blower motor and connect 2-pole coupling from adapter, switch on ignition, pull coupling from 33 °C switch (2) and bridge with ground. Run engine at idle.

Position of pushbuttons in blower switch	Blower speed	Nominal value
		± 1 V (+ 1A) (-2A)
Pushbutton "h" pushed	Fixed stage slow 1st stage	3.5 V (4A)
Pushbutton "g" pushed ¹⁾	2nd stage 3rd stage 4th stage 5th stage	4.5 V (5.5A) 5.5 V (7.5A) 6.5 V (9A) 8.5 V (13A)
Pushbutton "f" pushed	Fixed stage fast 6th stage	>11 V (18A)

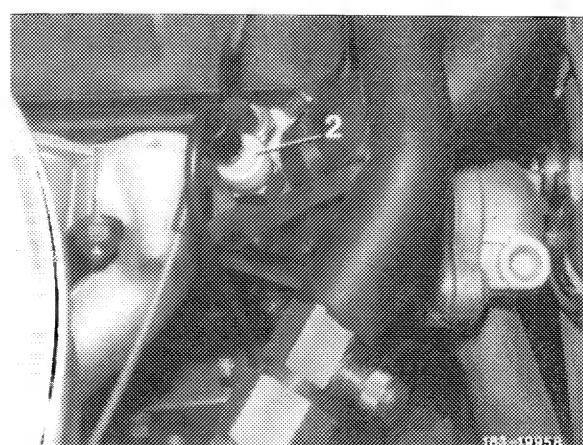
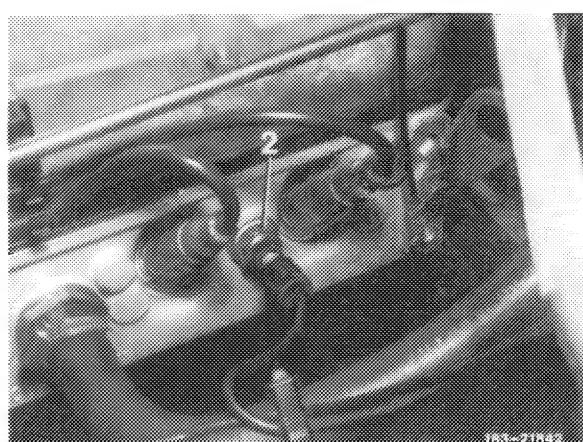
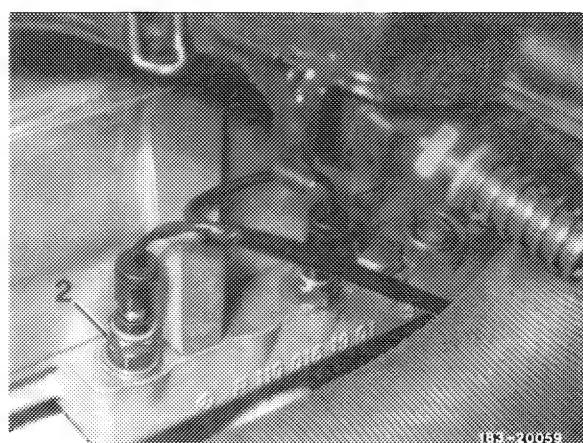
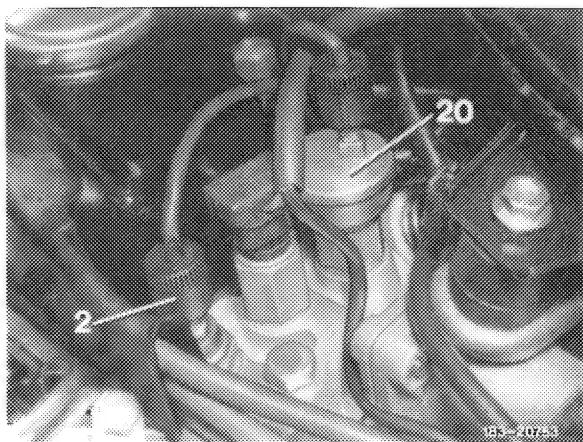
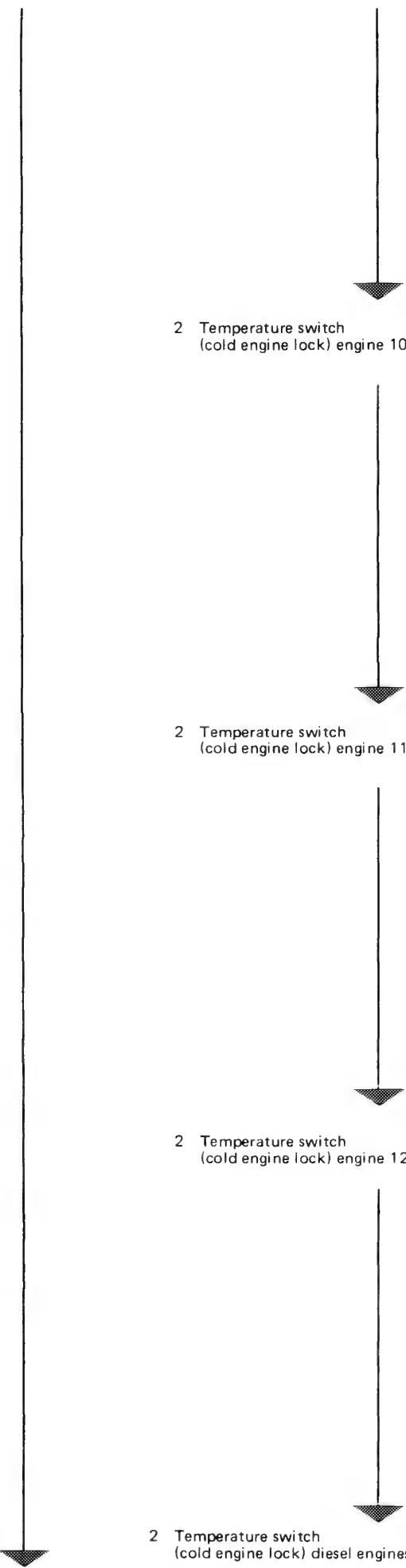
¹⁾ In warm surroundings (interior) set temperature dial up to stop in front of "MIN" or in cool surroundings, set temperature dial before "MAX".

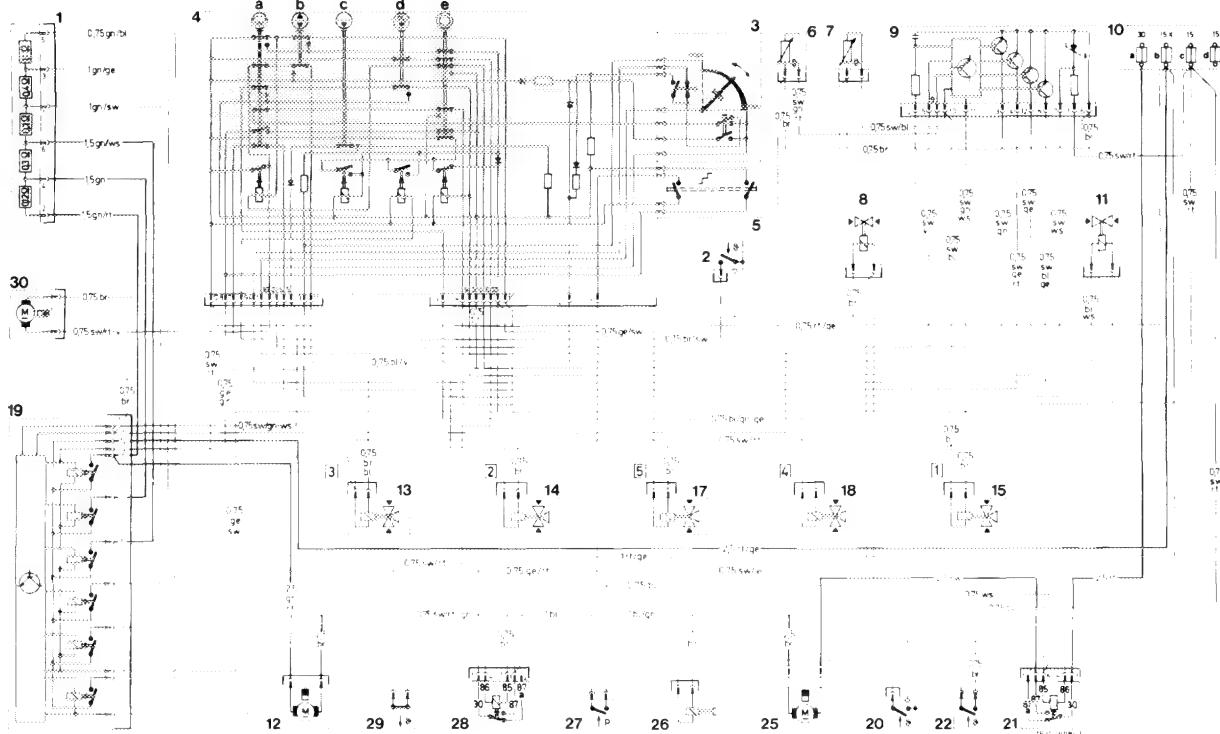
Nominal value correct	Nominal value wrong
-----------------------	---------------------

- 1. Check all electric lines for correct connection.
- 2. Connect new electronic switching unit for tryout.
- 3. Connect new blower switch for tryout.
- 4. Renew blower motor.
- 5. Renew pre-resistance group.



183-17660/1

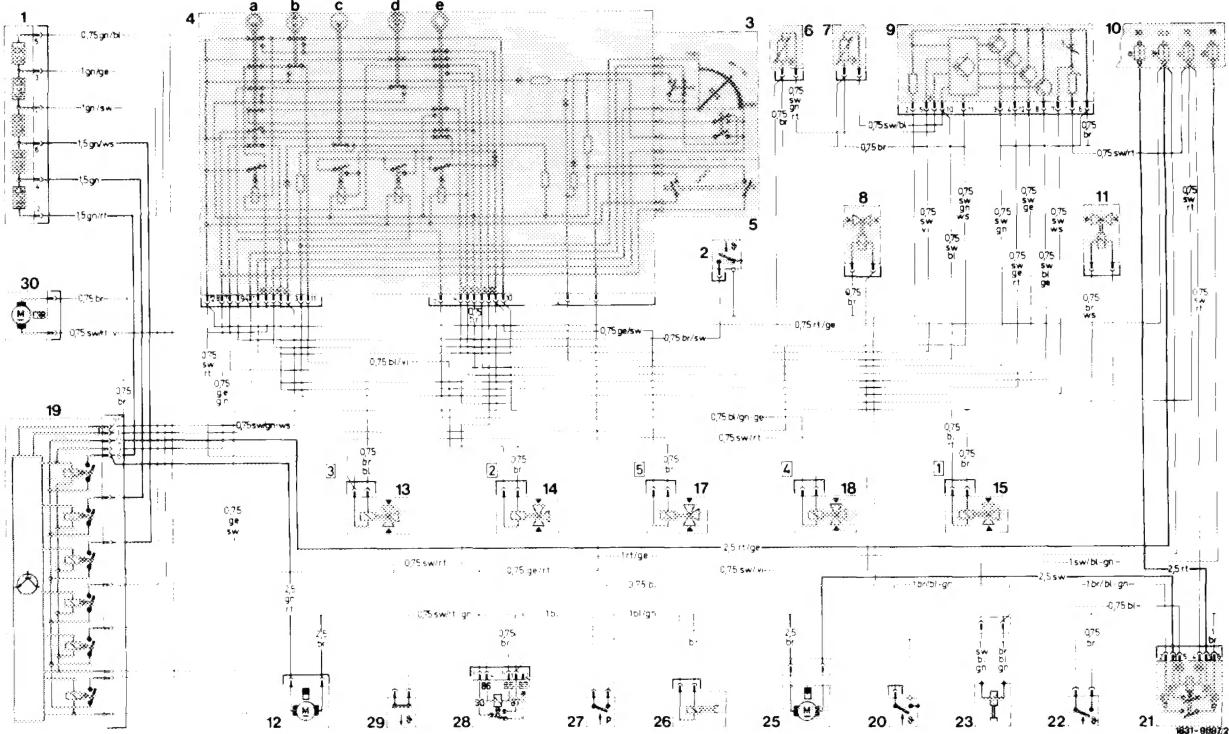




Electric wiring diagram automatic climate control
Model 123.0, 123.1

- 1 Pre-resistance group
- 2 Temperature switch (cold engine lock)
- 3 Temperature dial
- 4 Pushbutton switch unit
 - a Defrosting
 - b Top and bottom (also legroom)
 - c Normal adjustment (air conditioning on)
 - d EC (air conditioning off)
 - e Off
- 5 Blower switch
- 6 Temperature sensor for heat exchanger
- 7 In-car temperature sensor
- 8 Changeover valve for rpm stabilization (except 123.1)
- 9 Electronic switching unit for temperature control
- 10 Fuse box
 - a Fuse C: 16 amps.
 - b Fuse 8: 16 amps.
 - c Fuse 14: 8 amps.

- 11 Mono valve
- 12 Blower motor
- 13 Switchover valve for center nozzle flap
- 14 Switchover valve for legroom flaps
- 15 Switchover valve for defroster nozzle flaps
- 16 Switchover valve for main air flap
- 17 Switchover valve for recirculating air flap
- 18 Electronic switching unit for blower control
- 19 Temperature switch 100 °C for auxiliary fan
- 20 Temperature switch 52 °C for auxiliary fan
- 21 Relay auxiliary fan (code number 6)
- 22 Relay refrigerant compressor (code number 12)
- 23 Low-pressure switch refrigerant compressor
- 24 Relay refrigerant compressor (code number 12)
- 25 Auxiliary fan
- 26 Electromagnetic coupling — refrigerant compressor
- 27 Recirculating pump
- 28 ETR switch
- 29 Recirculating pump



Electric wiring diagram automatic climate control
Model 123.2

- | | |
|---|--|
| 1 Pre-resistance group | 11 Mono valve |
| 2 Temperature switch (cold engine lock) | 12 Blower motor |
| 3 Temperature dial | 13 Switchover valve for center nozzle flap |
| 4 Pushbutton switch unit | 14 Switchover valve for legroom flaps |
| a Defrosting | 15 Switchover valve for defroster nozzle flaps |
| b Top and bottom (also legroom) | 17 Switchover valve for main air flap |
| c Normal adjustment (air conditioning on) | 18 Switchover valve for fresh air – recirculating air flap |
| d EC (air conditioning off) | 19 Electronic switching unit for blower control |
| e Off | 20 Temperature switch 100 °C for auxiliary fan |
| 5 Blower switch | 21 Relay auxiliary fan and magnetic coupling
(code number 6a) |
| 6 Temperature sensor for heat exchanger | 22 Temperature switch 52 °C for auxiliary fan |
| 7 In-car temperature sensor | 23 Magnetic coupling for fan |
| 8 Switchover valve for rpm stabilization | 25 Auxiliary fan |
| 9 Electronic switching unit for temperature control | 26 Electromagnetic coupling – refrigerant compressor |
| 10 Fuse box | 27 Low-pressure switch refrigerant compressor |
| a Fuse C: 16 amps. | 28 Relay refrigerant compressor (code number 12) |
| b Fuse 8: 16 amps. | |
| c Fuse 14: 8 amps. | |
| d Fuse 10: 16 amps. | |
| 30 Recirculating pump | |

Checking switchover valves for main air-, recirculating air-, center nozzle-, defroster nozzle-, and legroom flaps:

Plug 2-pole coupling of harness to in-car temperature sensor.

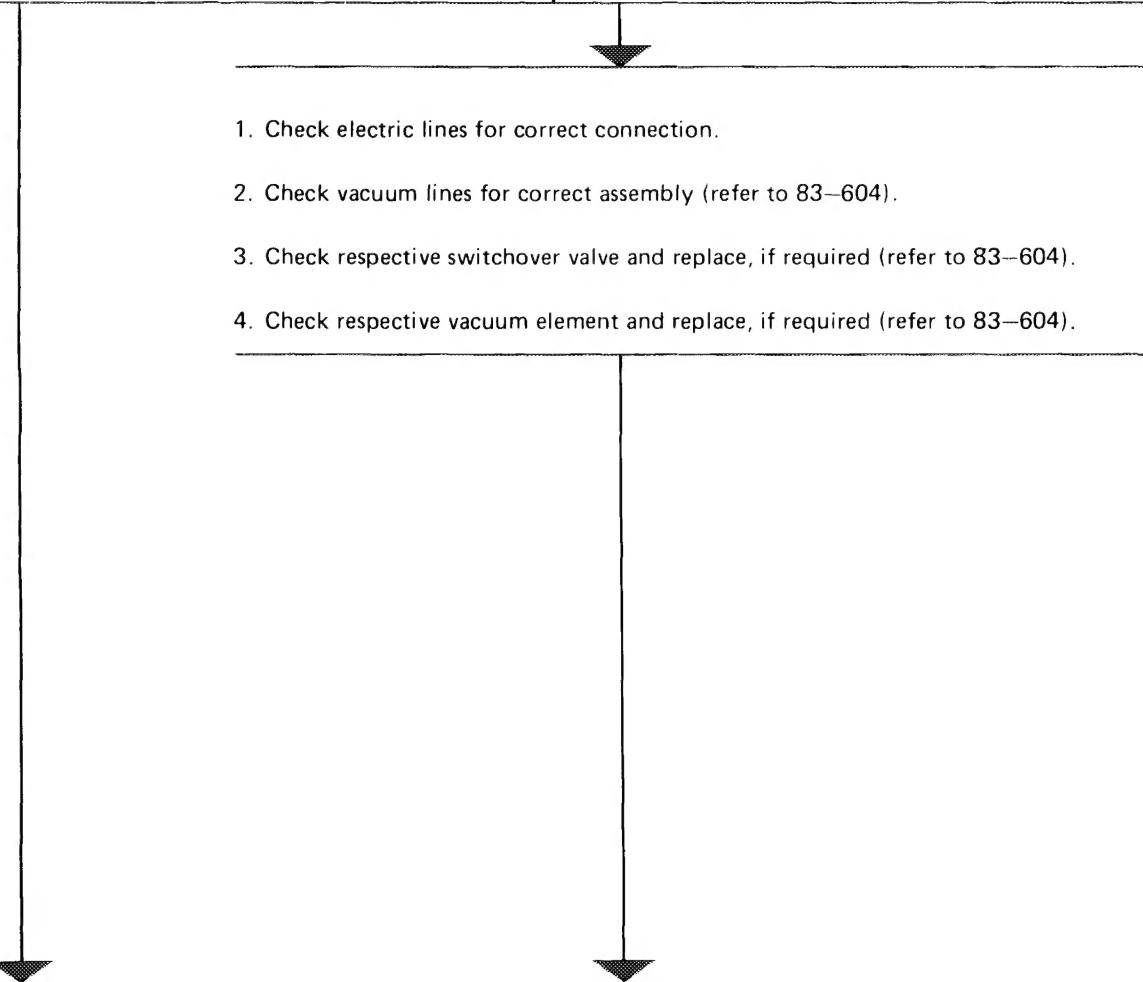
Connect battery, switch-on ignition, run engine at idle.

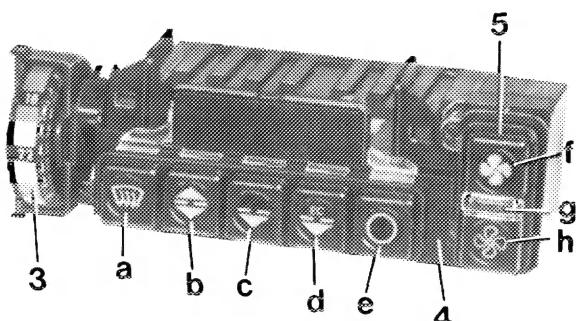
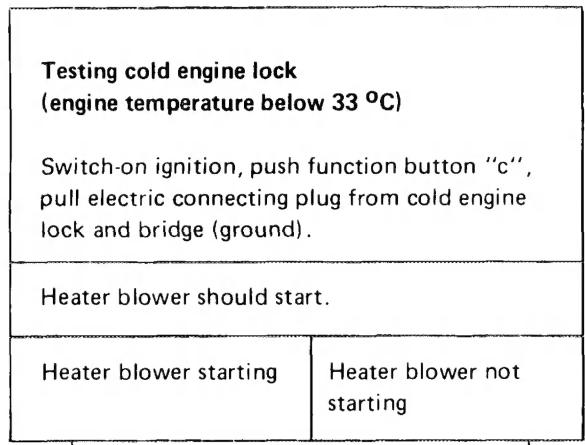
Function selection	Mode	Main air flap	Recirculating air flap	Center nozzle flap	Defroster nozzle flaps	Legroom flaps
		(fresh air indication in %)				
a	Heating mode	100	100	closed	open	closed
b	Heating mode	100	100	closed	open	open
	Cooling mode	100	20 ¹)	open	open	open
c	Heating mode	100	100	closed	Leak air closed	open
	Cooling mode	100	20 ¹)	open	closed	closed
d	Heating mode	100	100	closed	Leak air closed	open
	Cooling mode	100	100	open	closed	closed
e	Off	closed	20	closed	open	closed

¹) If the in-car temperature is 3 °C higher than the temperature set on temperature dial, the system operates with recirculated air.

Flap position correct

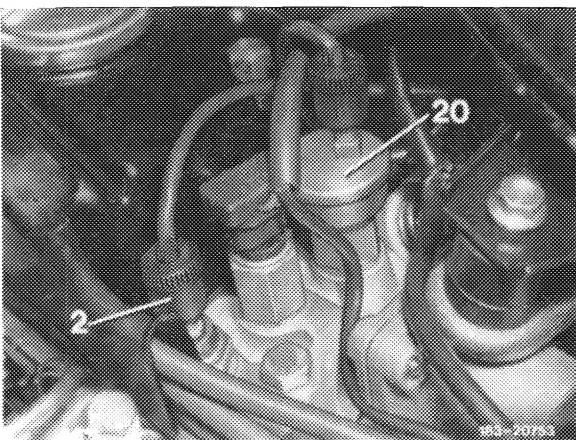
Flap position wrong

- 
1. Check electric lines for correct connection.
 2. Check vacuum lines for correct assembly (refer to 83-604).
 3. Check respective switchover valve and replace, if required (refer to 83-604).
 4. Check respective vacuum element and replace, if required (refer to 83-604).



1. Check electric lines for correct connection.
2. Check blower control (test step 12).
3. Change pushbutton switch unit.

2 Temperature switch
(cold engine lock) engine 102

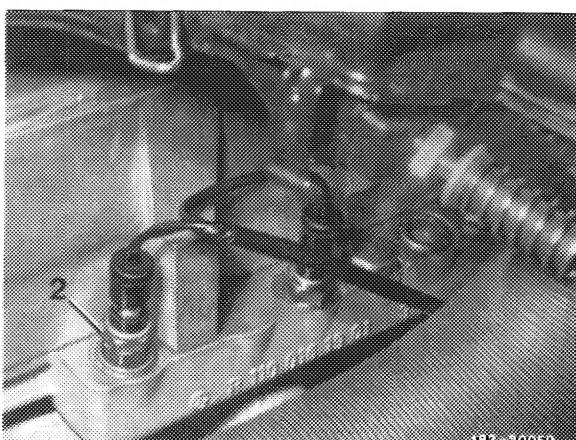


Attach plug to cold engine lock and run engine warm at approx. 2000/min. Push function selection button "c".
(Engine temperature > 33 °C)

Heater blower should start.

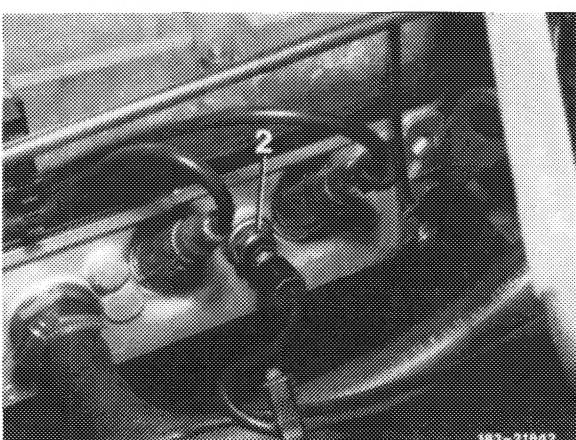
Heater blower starting	Heater blower not starting
------------------------	----------------------------

2 Temperature switch
(cold engine lock) engine 110

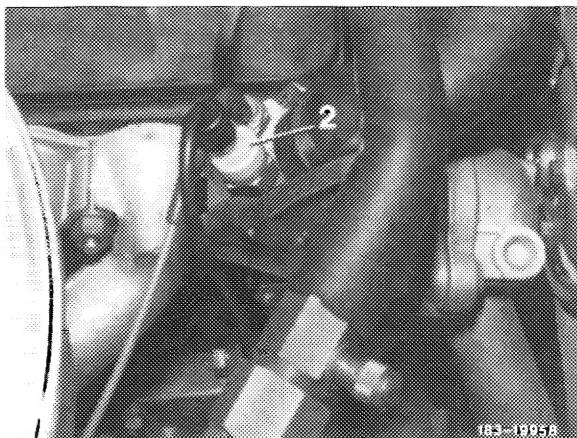


Renew cold engine lock.

2 Temperature switch
(cold engine lock) engine 123



2 Temperature switch
(cold engine lock) diesel engine



Checking mono valve for leaks

Set temperature dial to "MIN" engaged, push function selection button "b". Run engine to operating temperature (function test bench). Heat exchanger should remain cold, that is, no heated air should come out.

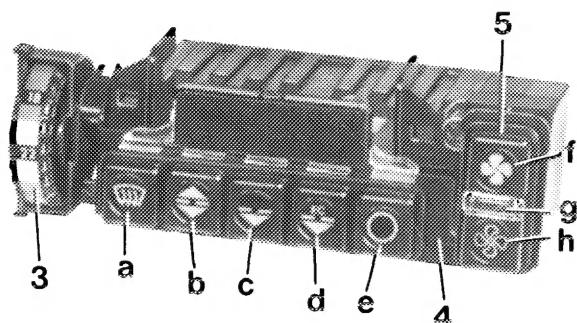
Heated air not
coming out

Heated air coming
out

1. Check whether plus and minus are connected to coupling for mono valve.

Caution: short circuit risk!

2. Connect electronic switching unit for temperature control (9) for tryout.
3. Renew mono valve (11).



End of test

